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CRITICISMS AND DISCUSSIONS.

HEINRICH HERTZ'S THEORY OF TRUTH.

A CONTRIBUTION TO CRITIQUE OF COGNITION.

In a paper read before the American Philosophical Association in 1902,[1] I explained critique of cognition to be the examination of systems of cognition *according to principles* and briefly sketched out these principles. They were formulated as conditions which a system must satisfy, and formed four groups the last of which was the group of the conditions of *truth*. This group has the remarkable property that it requires the fulfilment of all the other conditions. We can therefore say that critique of cognition has for its problem the determination of the content of truth of the systems of cognition. Its principles can be considered as principles of truth, and so it is clear that the problem of truth is the most important and deepest which the establishment of the principles of critique of cognition offers.

The first condition of this last group determines the truth of a system *with relation to its generating problem*; a second condition determines the truth of *the generating problem itself* and therewith the truth of the system not relatively to its own problem but with respect to the system of cognition.

The conditions of truth have been formulated differently in the different schools. We can distinguish two large groups and call them (1) the group of the external conditions of truth and (2) the group of the internal conditions of truth. The first, in determining the truth of a system B, takes another system A as given; the truth of the system B is then determined with respect to A as "agreement" or "correspondence" of B with A. It goes beyond the system B to *another* system A, the "object," or "nature," or the "things." It is the theory of truth of *realism* or *dualism*. The other does not take

[1] See *Journal of Philos.*, VI, No. 11, p. 281.

such a system A as given but remains within the system B and determines truth as a condition for the system B itself. It is the theory of truth of *idealism* or *monism*.

The dualistic theory of truth has the disadvantage of a seeming clearness, determinateness and easy application. We can represent A and B as realms by two circles; they are determined by their laws of necessity; the realm A is the realm of natural necessity (*Naturgesetzlichkeit*), the realm B that of logical necessity (*Denkgesetzlichkeit*).

If then b_v is any element of B, I can apply the condition of truth to it and say: b_v is a true system, (concept, theorem), if there is an a_v with which it *agrees*. I think it is not saying too much to assert that dualism has recommended itself to scientific thinking by its seemingly useful theory of truth.

However at nearer examination it offers great difficulties. It is not my intention to consider them here in general, but to criticise a special case, which is however of conspicuous importance for the whole theory.

Even if we presuppose for the present that we know what is to be understood by this agreement (correspondence) and how it is to be measured, we must ask: how far must the correspondence go? Shall we understand that by this is meant a complete correspondence, or may it be partial? And if the latter, shall that mean that any correspondence suffices to make the system B a true one? If not, it must be determined exactly how far this correspondence must go, and then it will not be the correspondence in general which determines the truth but this precisely-to-be-determined degree of correspondence.

Of all those who have stated a realistic theory of truth Heinrich Hertz alone, so far as I am aware, has tried to determine this degree of correspondence. His theory, which he has developed in the famous introduction to his *Principien der Mechanik,* is the special case of which I spoke, and which we shall criticise.

The realms A and B are with him also determined by the laws of their necessity, A by the *Naturnothwendigkeit,* B by the *Denknothwendigkeit*; A is "things," B the *Scheinbilder* or "symbols," which we ourselves "make" of the things. The elements of B as mere *Scheinbilder* or symbols have of course of themselves no agreement whatsoever with things, neither complete nor partial. But we make these *Scheinbilder* so that they satisfy a certain condition, which we shall designate by V and call the condition of truth.

Hertz himself calls V the *Grundforderung* (fundamental require-
ment or condition) and the symbols which satisfy it, *Bilder* (images)
or more exactly *richtige Bilder* (correct images). In so far as the
elements of B satisfy the condition V, he says that they *correspond*
to the elements of A. The images are called also our "represen-
tations of the things." "They have the one essential correspondence
with things which lies in the fulfilment of the above-named con-
dition (V), but it is not necessary for their purpose that they have
any further correspondence with the things. Indeed we know not
and have no means of finding out, whether our representations of
things agree with them in anything else than just that one funda-
mental relation."[2] All those naive theories which speak of a complete
correspondence of our representations to the things, or of a cor-
respondence at all which belongs to the representations as such are
therewith placed outside discussion; we "make" these representa-
tions and we call them "correct," or true, or in correspondence with
the things, if they satisfy a certain condition V.

Everything depends therefore on this condition V; it deter-
mines the truth of the realm B. Its critique is the critique of his
theory of truth. Hertz formulates it thus: we make the symbols
of the outer objects "such that the logically necessary consequences
of the images are always again the images of the naturally necessary
consequences of the depicted objects."[3] The content of this condition
seems to be precisely that great method of determining truth in
physics, namely, the experiment.

It will be useful for our further consideration to represent con-
dition V symbolically. If I designate by b_μ and b_ν two images, by
$f_l (b_\mu)$ the logically necessary consequence of b_μ, by a_μ and a_ν two
things, by $f_n (a_\mu)$ the naturally necessary consequence of a_ν, and
by ϕ a law of representation, according to which to every a_λ belongs
a definite b_λ, then condition V can be formulated thus:

$$\text{If } b_\nu = f_l (b_\mu)$$
$$\text{and } a_\nu = f_n (a_\mu)$$
$$\text{then } b_\mu = \phi (a_\mu) \text{ is a true image}$$
$$\text{if } b_\nu = \phi (a_\nu)$$

On the other hand we can say: For every image $b_\mu = \phi (a_\mu)$, which
satisfies condition V,

$$b_\nu = \phi (a_\nu)$$
$$\text{if } a_\nu = f_n (a_\mu)$$
$$\text{and } b_\nu = f_l (b_\mu)$$

[2] *Principien der Mechanik*, p. 2.
[3] *Principien der Mechanik*, p. 1.

From this follows: it is necessary that
$$b_\nu = \phi \cdot [f_n \cdot (a_\mu)]$$
if $b_\nu = f_l (b_\mu)$

That is, the condition requires that I obtain the *same* image b_ν, whether I determine it as the *denknothwendige* consequence of b_μ or as the image of the *naturnothwendige* consequence of a_μ.

We can express this as follows: If B is a realm for which the condition V is satisfied, then B is closed in itself with respect to the operation f_l; i. e., every logically necessary consequence of any elements of B is itself an element of B; because it can always be considered as image of an element of A; that is,

if $w = f_l (b_\lambda)$
then $w = \phi (a_\kappa)$
$= b_\kappa$ if V is satisfied.

If therefore such a realm B for which the condition V is satisfied, is once determined, it can be considered as *Modell* of A; i. e., the image of any A can be obtained by logically necessary conclusions from B. And this task, to determine B so that in our considerations it can be substituted for A, is the purpose which we have in establishing B. We start with A, which we consider as given; this we represent, in conformity with the condition V, by B which we finally substitute for A. The possibility of this substitution is expressed by the equation, and we can therefore finally say: If a realm A is given, and B is determined as image of A such that the condition V is satisfied, then:

$$A = B.$$

We have now sufficiently analyzed the fundamental requirement to be prepared for its critique.

I preface it with the remark that we must carefully distinguish between the thesis: B is a true system because it has with an (objectively given) realm A the correspondence specified by the fundamental condition V; and the thesis: if B is a true system it can be considered as image of a realm A which we call objectively given and with which it has the correspondence specified by V. For the first thesis the realm A is essential, for the correspondence with A makes B a true system. This is the thesis of Heinrich Hertz. For the second, A is not essential, since B is otherwise determined as true; the realm A can be considered as an interpretation of the system B, or *vice versa* B as image of a realm A presupposed as given. This way of conceiving B has proven very convenient for the natural sciences and is therefore in general, probably unavoidable, use; only it is im-

portant to remark that this is by no means essential for a pure system of natural science.

The realm B is the realm of the images of A; they are symbols which are determined as a realm by "logical necessity"; *but by what condition are they determined as images of elements of A?* That is, by what condition are these symbols distinguished as images of A from other symbols in the realm of logical necessity?

To this we can answer that the realm B *is* the realm of the images of A. But by this we would say that what is logically necessary is *eo ipso* image of something naturally necessary; the realms "logical necessity" and "image of A" coincide. But this was evidently not the thesis. The distinction of the realms A and B originated in the conviction that there was logical necessity, which did not represent natural necessity; in other words, that the criterion of logical necessity was not sufficient for the determination of truth. But if we say that the image of A lies indeed in the realm D of logical necessity, then we must specify the condition by which B is distinguished from the rest of D. This question is the more urgent if we base the condition of truth on the property of being an image, as Heinrich Hertz does. For the *Grundforderung* says: b_μ is a *true* image, if b_ν, the logically necessary consequence of b_μ, is the *image* of a_ν, the naturally necessary consequence of a_μ.

$$\text{If } b_\nu = f_l\,(b_\mu)$$
$$\text{then } b_\nu = \phi\,[f_n\,(a_\mu)]$$

We must therefore have a condition by which we determine whether b_ν is indeed image of $a_\nu = f_n\,(a_\mu)$. If every logical necessity were *eo ipso* image of a natural necessity, then the fundamental condition would be superfluous. We cannot say here that these images are given to us by sensation; for we "make" these images and the images are mere "symbols."

This first answer to the question: what is the condition which the symbols must satisfy in order to be images of A, led to the destruction of the *Grundforderung*. But a second answer is possible, and it seems as if Hertz himself had had it in mind, namely, *that the condition that we seek, is the condition V itself.* He says: "We make for ourselves inner *Scheinbilder* or symbols of outer objects and we make them so that the logically necessary consequences of the images are always again the images of the naturally necessary consequences of the represented objects"; or in our formulation, we make them so that they satisfy condition V.

Then the condition of truth and the condition of being an

image are the same.   Symbols of the realm B of the logical necessity which satisfy the condition V, are at the same time images and true images.   In other words: a symbol b_λ is either a true image of a_λ, or it is *not* a true image; whether it then can still be an image at all, as for instance a *false* image,—about this we know nothing.

The formulation, "image and true image are identical," is indeed required by the condition V itself.   For we said:

$$b_\nu = \phi \; [f_n \; (a_\mu)]$$

where it is evident that we must understand by the representation ϕ a true image; i. e., if b_ν might possibly be a false image then it could decidedly not prove that b_μ, from which it logically follows, is a true image.

If we now write ϕ_t for a *true* representation, then V will take the form:

$$\text{if } b_\nu = \phi_t \; (a_\nu)$$
$$\text{then } b_\mu = \phi_t \; (a_\mu)$$

Thus the truth of b_μ is based, by the fundamental condition V, on the truth of its logically necessary consequence, therefore on the truth of another image, and it would be necessary for us to have previously somehow and from somewhere a true image, then we could by means of V determine the truth of other images.   Still we could not determine the truth of the first image by the condition V. So Hertz forsakes his first point of view, that the images are mere symbols, in themselves neither similar nor different, neither true nor false; and takes his refuge in another criterion of truth, namely experience.   "If we have once succeeded in deducing from the collected past experience images of the required quality..."   This however means nothing but that the condition V as criterion of truth has been given up, it was to decide about the truth of the images; instead he appeals to the *angesammelte Erfahrung* to give us true images and at the same time to guarantee them!

<div align="right">KARL SCHMIDT.</div>

PEQUAKET, N. H.

A MONISTIC CONCEPTION OF LIFE AND LIFE AFTER DEATH.

IN REPLY TO JOHAN GUSTAF BJOERKLUND AND HIS EXPOUNDER, MR. J. E. FRIES.

Among the thinkers who have pondered over the problem of the immortality of the soul, Gustaf Björklund is prominent by reason